BIAD –Blind Insertion Airway Device

2011 Georgia Office of EMS Updates

Georgia Department of Community Health

DCH Mission

ACCESS

Access to affordable, quality health care in our communities

RESPONSIBLE

Responsible health planning and use of health care resources

HEALTHY

Healthy behaviors and improved health outcomes

Georgia Department of Community Health

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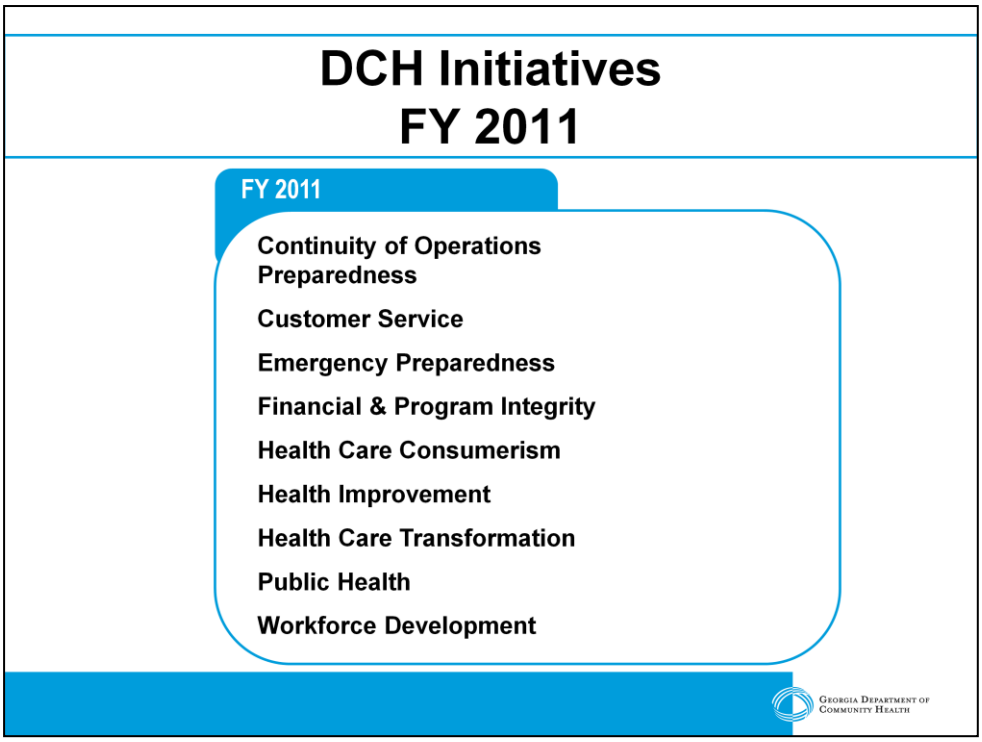

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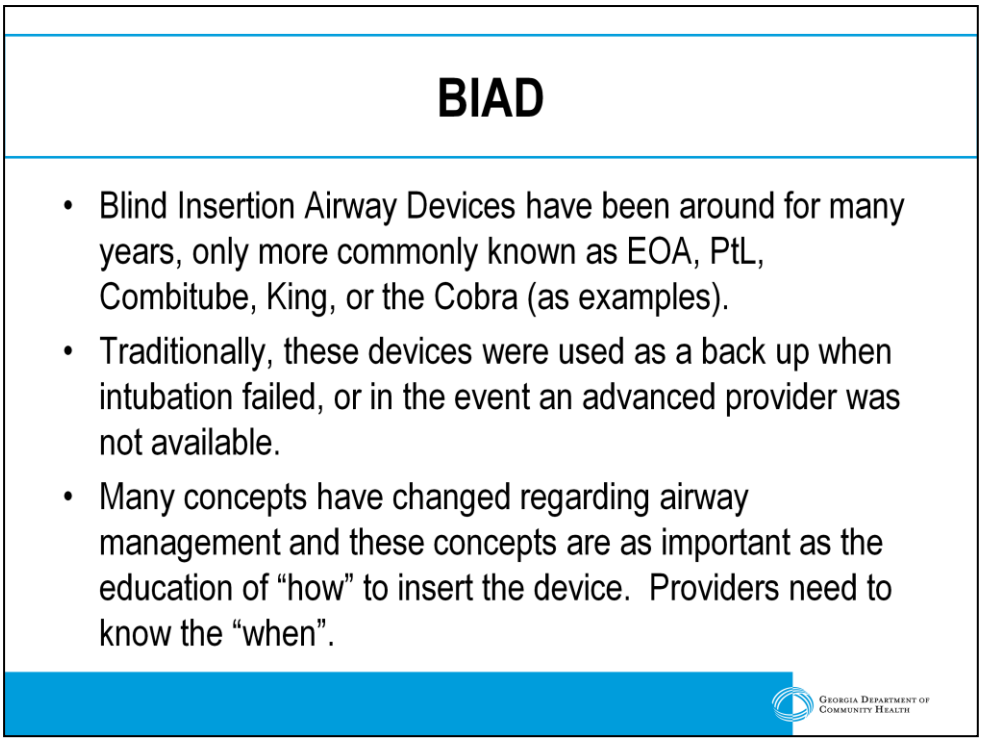
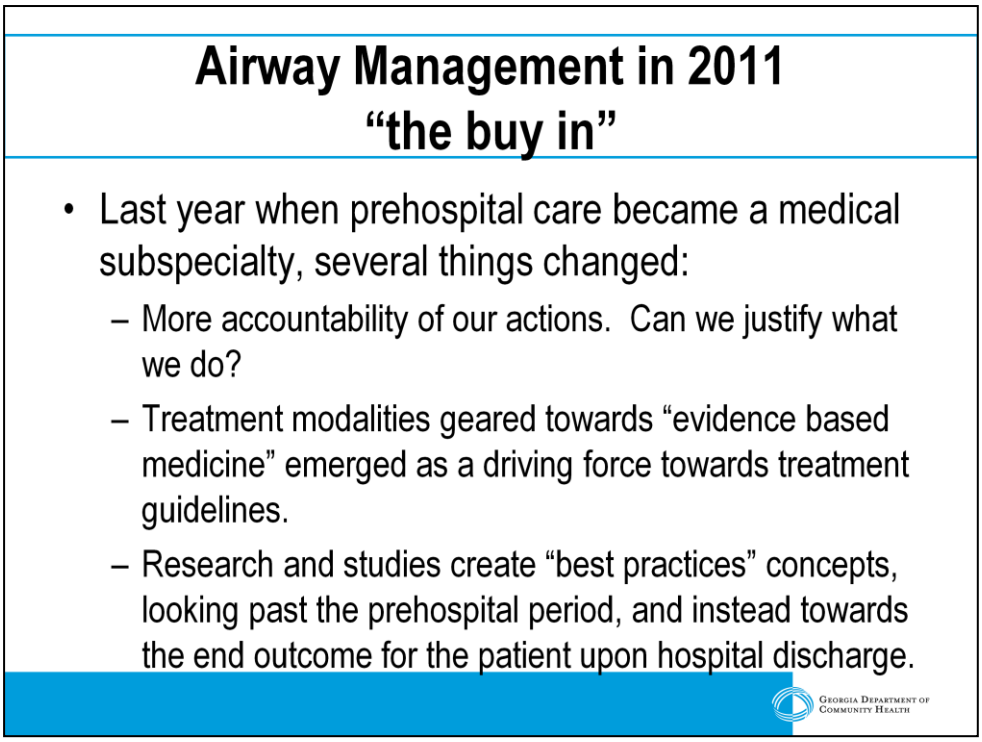
Credits

Prepared By: Douglas County Fire Department

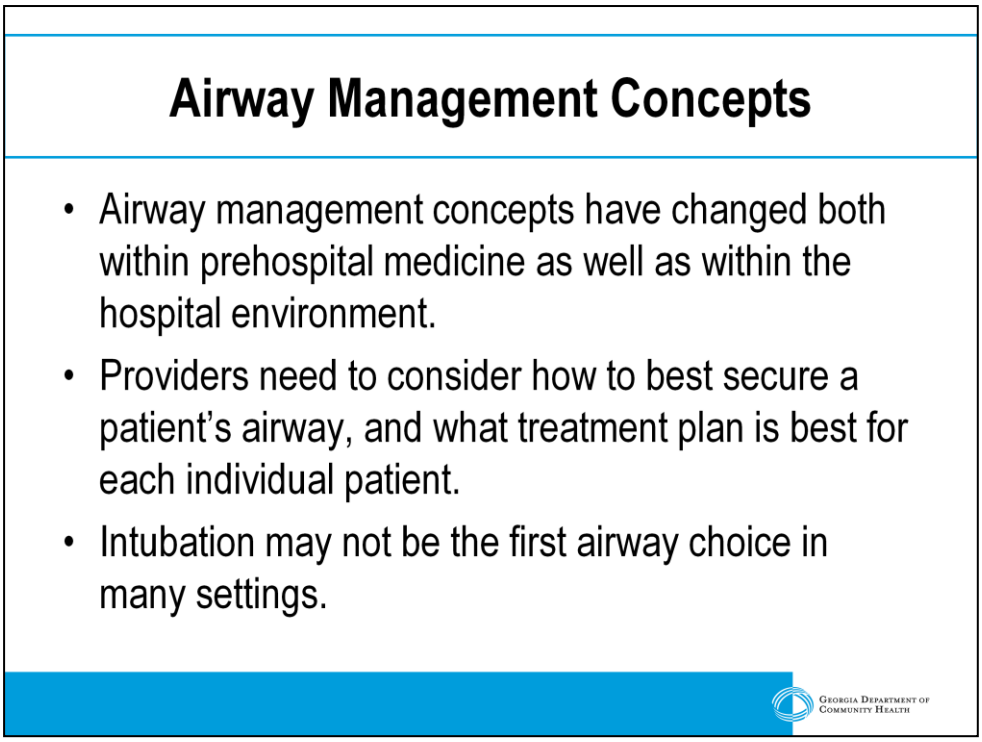
Georgia Department of Community Health



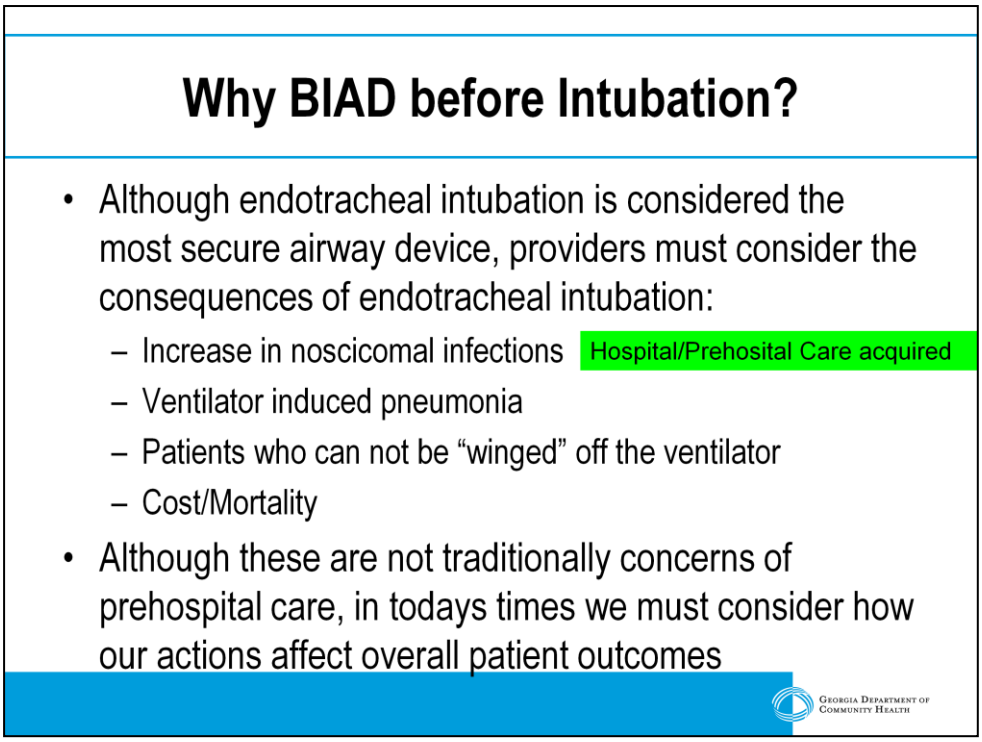
Blind insertion airway devices have been around for decades in prehospital medicine as a back up for failed intubation attempts. More commonly known as the EOA, Combitube or the King airway, these devices provided us the ability to secure an airway in those patients whom intubation was not possible. Trends in EMS are leading us more towards BIAD insertion as a front line treatment option over intubation and the reason for this will be explained during this presentation. Many concepts in airway management have changed over the years and providers must understand not only the "how" of inserting a BIAD but also the "when" these devices should be utilized.



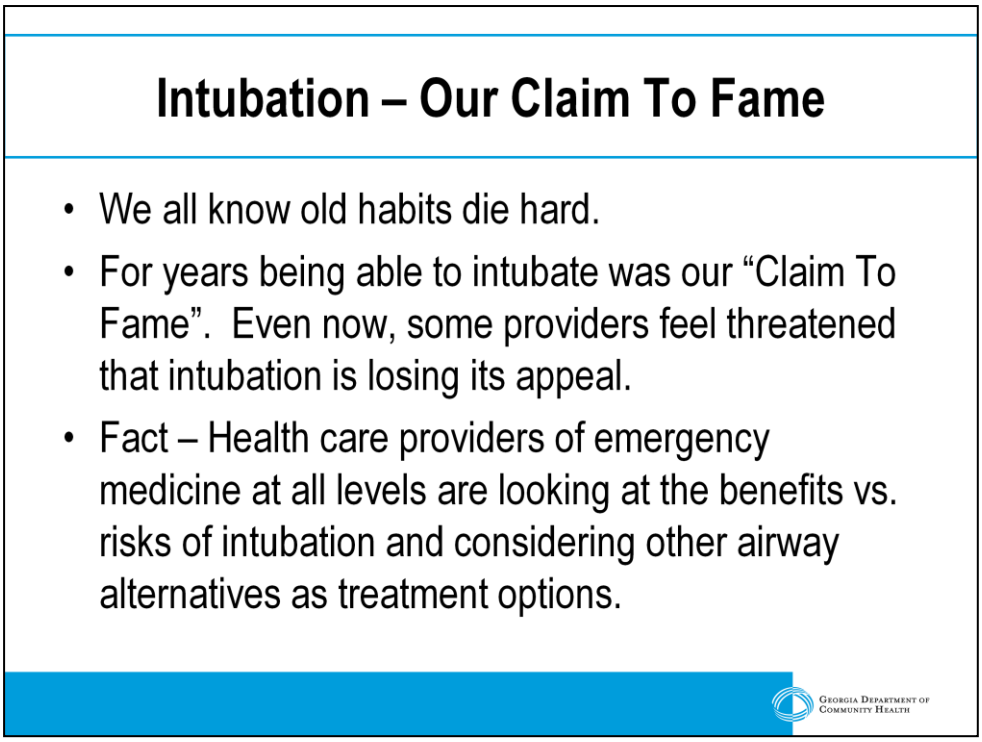
EMS must begin to understand the care we provide for our patients lasts longer than the prehospital period. Last year when prehospital care became a medical subspecialty, we took on a more formal role in the medical profession. Prehospital clinicians must be accountable for our actions. Ask yourself, can we justify what we do and how we managed this patients airway? Is there evidence to support our treatment guidelines? Further, in an integrated concept of patient care, how will our patient care affect the end outcome of the patient upon hospital discharge. As examples, excessive fluid we administer to patients must be corrected in the ICU, infections caused by non-aseptic techniques must be addressed, and complications arising from intubations must be overcome. We must begin to see how our patient care impacts our patients beyond the period of time we have contact with them.



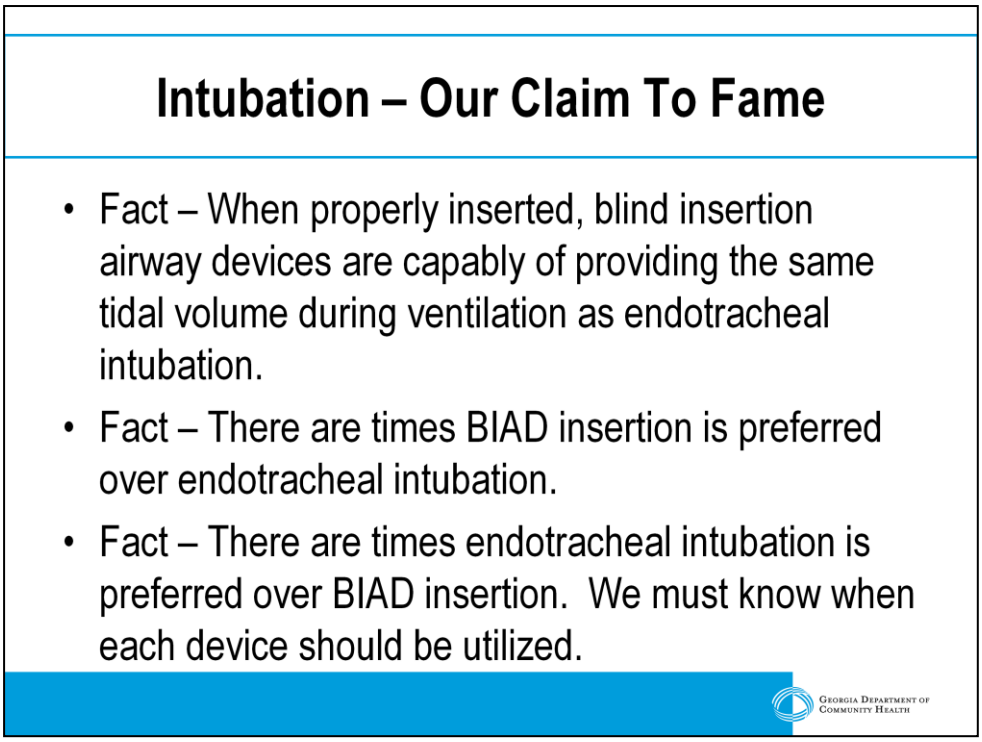
If you look closely enough, you will see these concepts changing at many levels of patient care. Respiratory therapists opting for CPAP devices over early intubaton in the emergency room, or BIAD devices becoming front line advanced airway management in the field. Providers MUST (STRESS) begin to consider each patient and determine what best fits the needs of the patient.



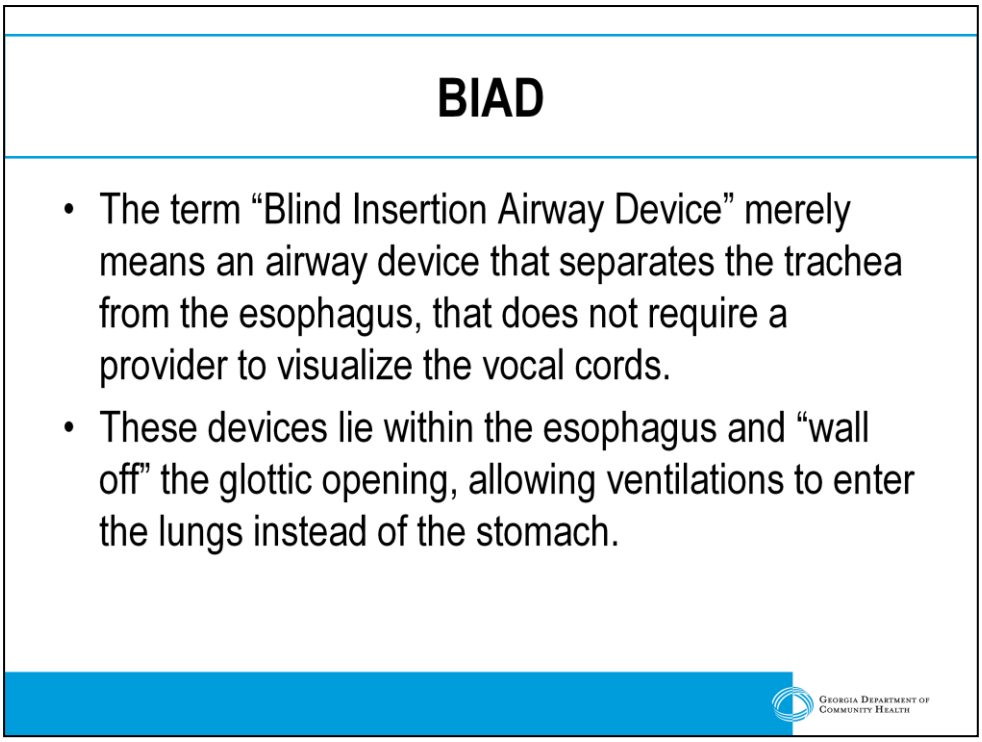
There has been a lot of discussion amongst prehospital providers regarding the push for BIAD devices before intubation. Although endotracheal intubation is considered the most secure airway device, providers must consider the consequences of endotracheal intubation. Endotracheal intubations can lead to: an increase in hospital or prehospital acquired infections and ventilator induced pneumonia. Further, some patients experience difficulty when attempting to come off the ventilator. As with anything related to medicine, there is always a financial consideration. Although these are not traditionally, these are not concerns of prehospital care, in todays times we must consider how our actions affect the overall outcome of the patient.



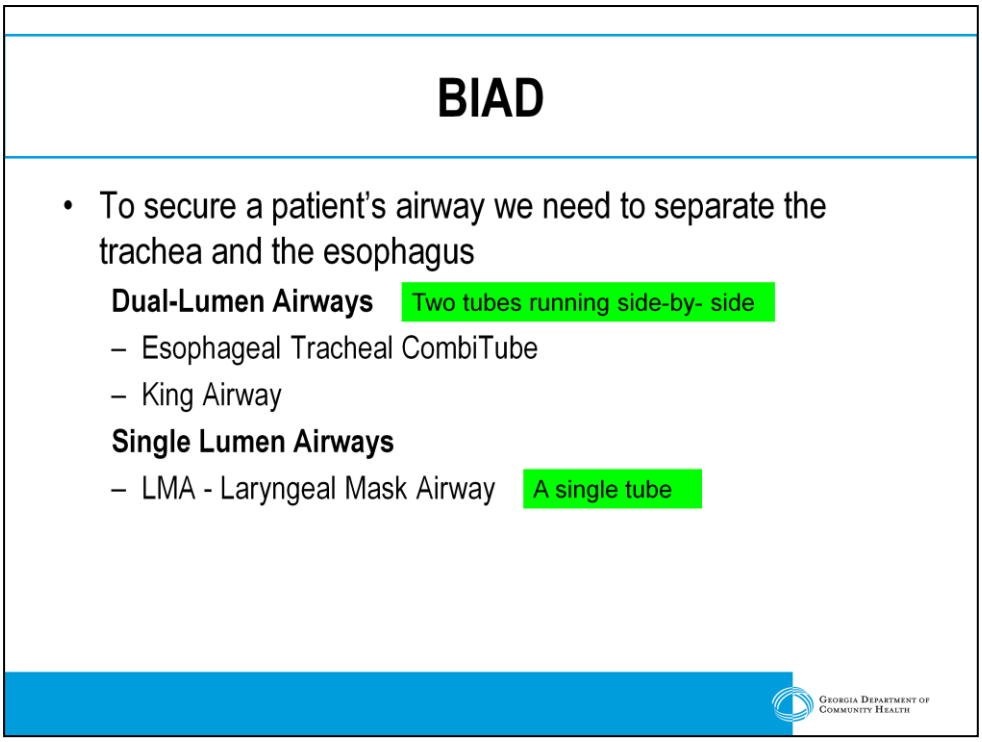
For so many years intubation has been at the forefront of advanced airway management it can be difficult for providers to consider the idea that intubation may not be in our patients best interest. For so long intubation has been our "claim to fame" some providers are reluctant to consider other alternatives, and even feel threatened that intubation is losing its appeal. Rest assured that health care providers at all levels are experiencing the same changes regarding airway management and concepts are changing across the board. Consider this, how often are patients intubated in the OR for routine procedures? Most of the time, patients have LMAs placed unless there is a reason a patient requires intubation. This has been standard practice for many years. Again, even respiratory therapy in the urgent setting is changing and CPAP is being utilized when possible.



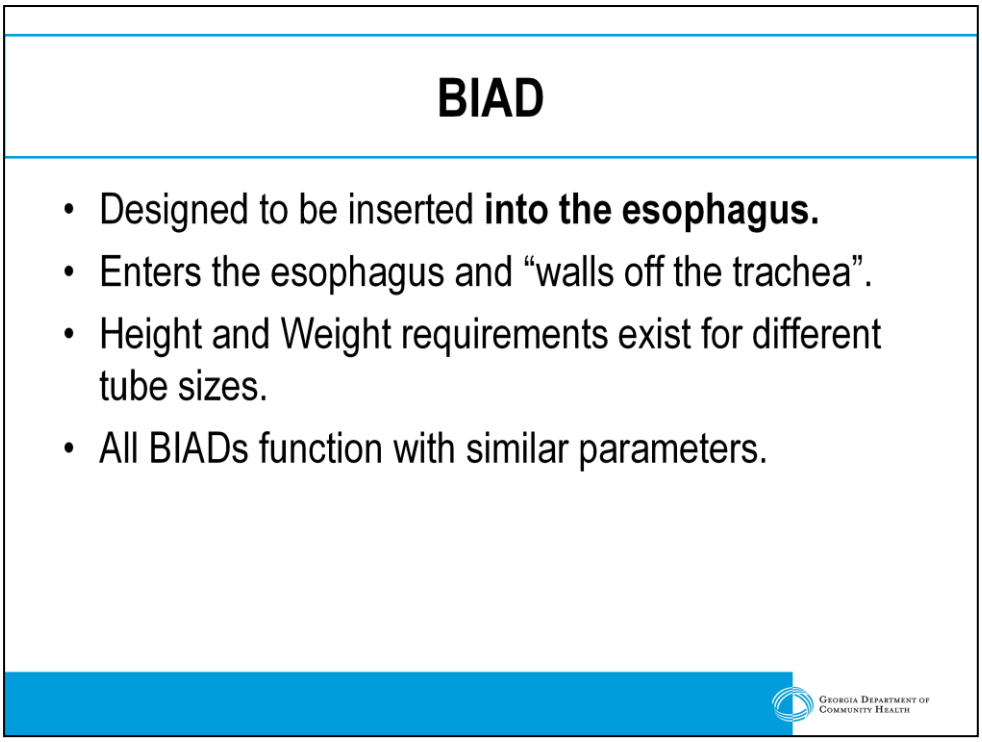
When properly inserted, BIADs are capably of providing the same tidal volume during ventilation as endotracheal intubation. There are times BIAD should be considered first over intubation, and there are times intubation should be attempted immediately. Our job as clinicians is to know the difference and provide our patients with the best airway management practices available.



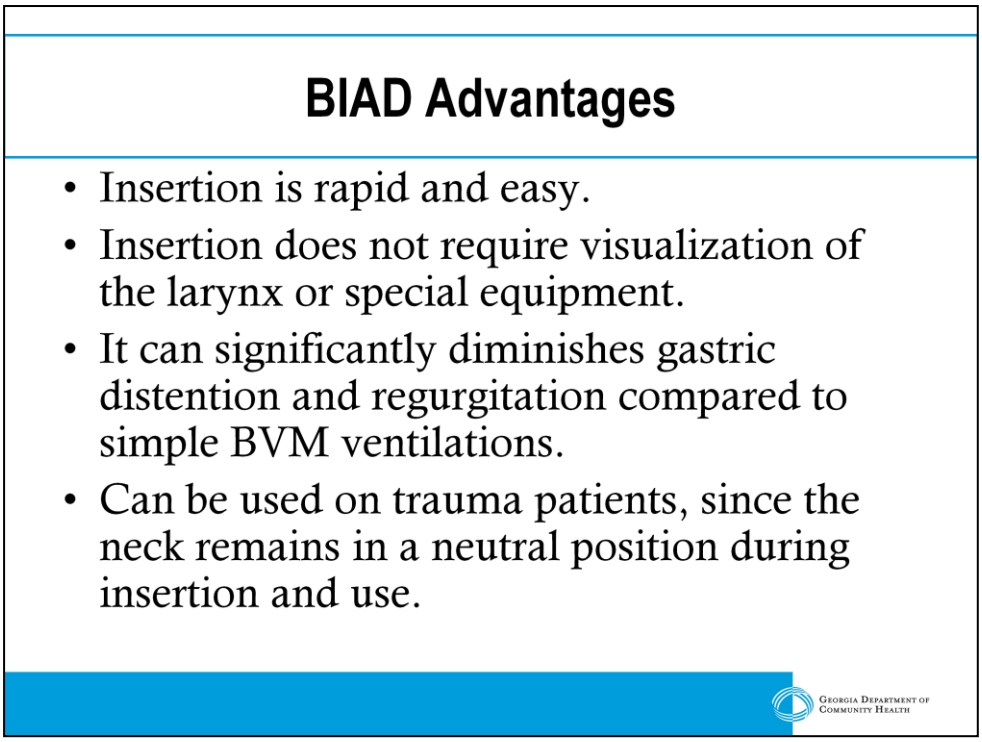
BIAD devices have been around for years. Its not so much about the devices that has changed as it is the concepts of when these devices should be utilized. Hopefully, we’ve been able to help explain some of these concepts over the past few minutes. To look at the BIAD itself you will see several “new and improved” versions of these devices, but the basic principle of separating the glottic opening from the stomach remains the same. The term “Blind Insertion Airway Device” merely means an airway device that separates the trachea from the esophagus, that does not require a provider to visualize the vocal cords.



On the slide presentation you will see several examples of BIADs. There are additional devices that fall into each category and the three most common are reviewed in this presentation. The general concepts behind all BIADs remain the same however and providers should be comfortable with the equipment they carry in the field. There are two main types of BIADs, those that have two lumens (or tubes) and those with only one.



All BIADs are designed to be inserted into the esophagus and "wall off the trachea". Each device has its own height and weight requirement but all BIADS have the similar parameters and insertion principles.



Before we review how to insert these devices, lets talk about some of the advantages of using a BIAD.

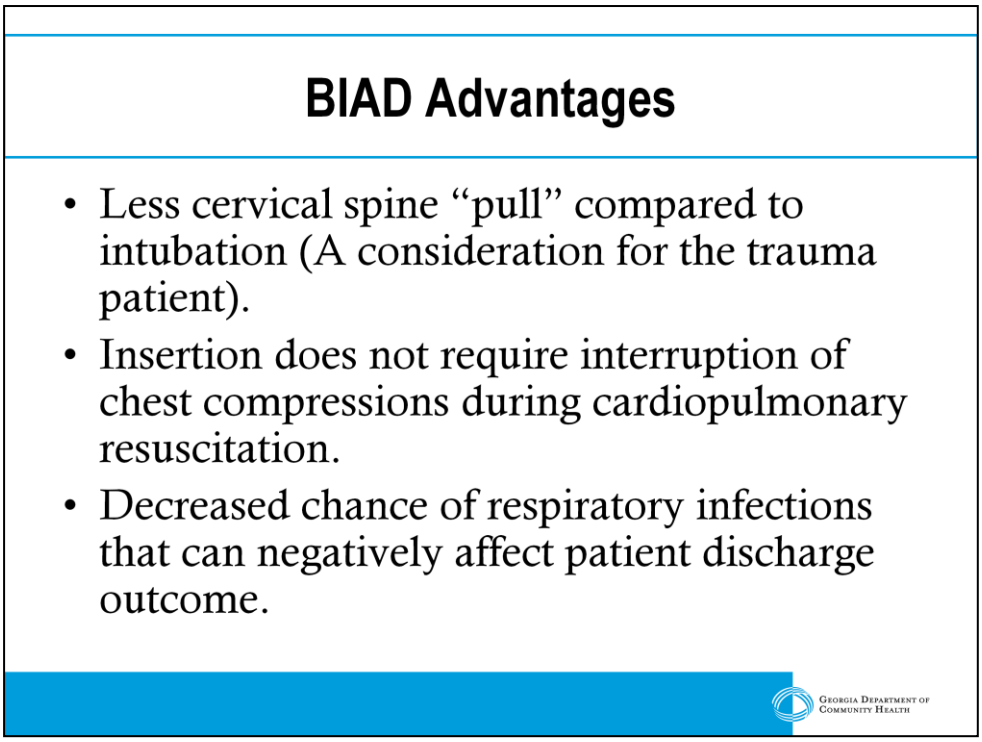
Insertion is rapid and easy.

Insertion does not require visualization of the larynx or special equipment.

It can significantly diminishes gastric distention and regurgitation compared to simple BVM ventilations.

Can be used on trauma patients, since the neck remains in a neutral position during insertion and use.

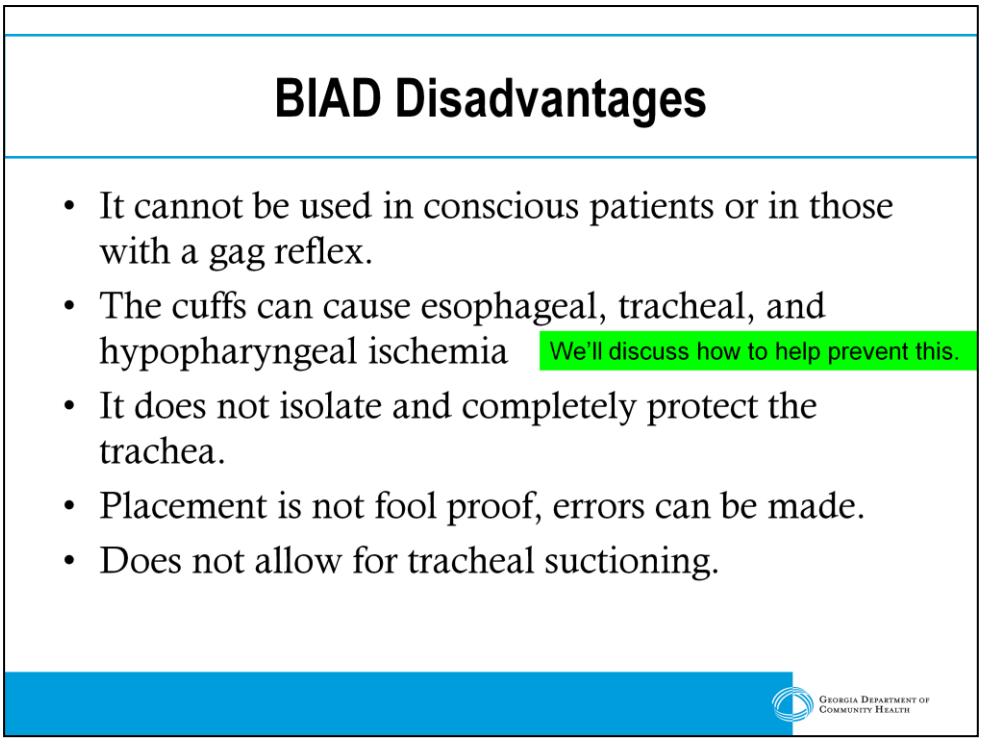
Further… (CHANGE TO NEXT SLIDE)



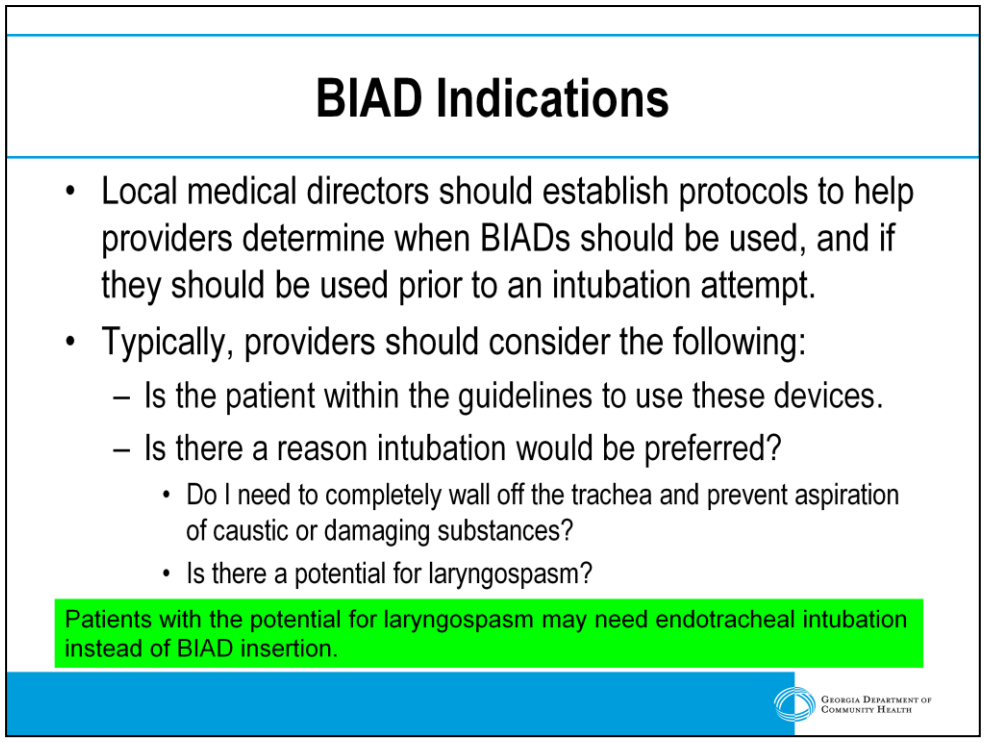
BIADs create less cervical spine "pull" compared to intubation which should be a consideration for the trauma patient.

Insertion does not require interruption of chest compressions during cardiopulmonary resuscitation.

And, there is a decreased chance of respiratory infections compared to intubation that can negatively affect patient discharge outcome.



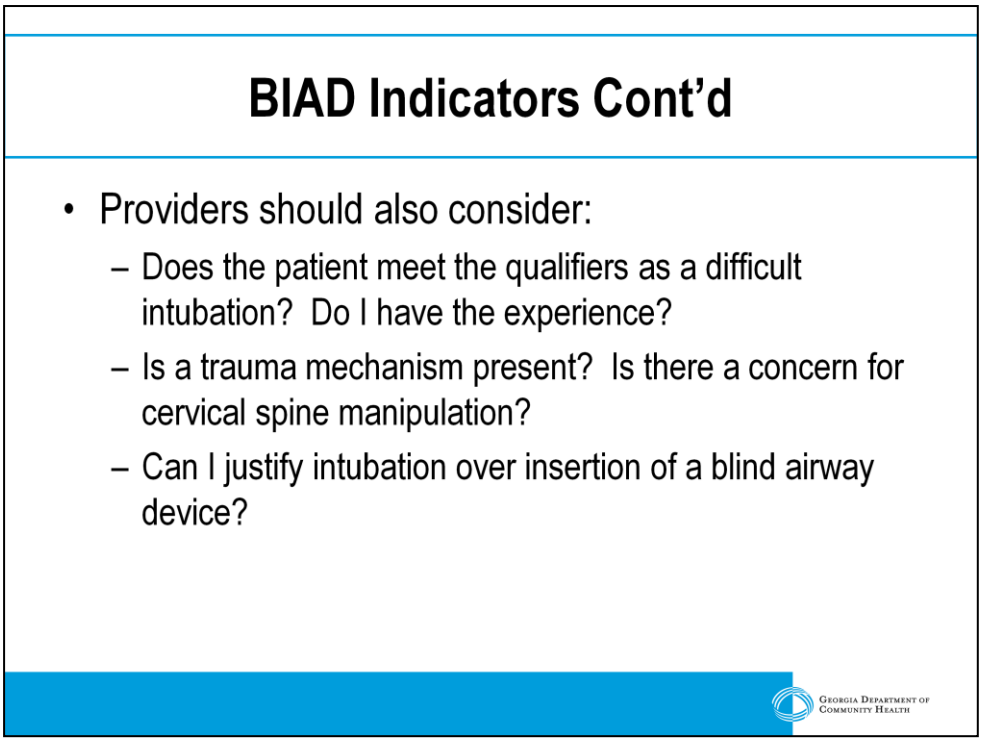
So far, the BIAD device sounds like the best invention ever, but as with any piece of medical equipment, there are disadvantages that must be considered. BIADs cannot be used on conscious patients with a gag reflex. BIADs can sometimes lead to esophageal, tracheal, and hypopharyngeal ischemia, and it does not completely isolate the trachea. Placement is not fool proof, and errors can be made. It is also not the appropriate device to insert if the patient requires tracheal suctioning since this is not possible with these devices.



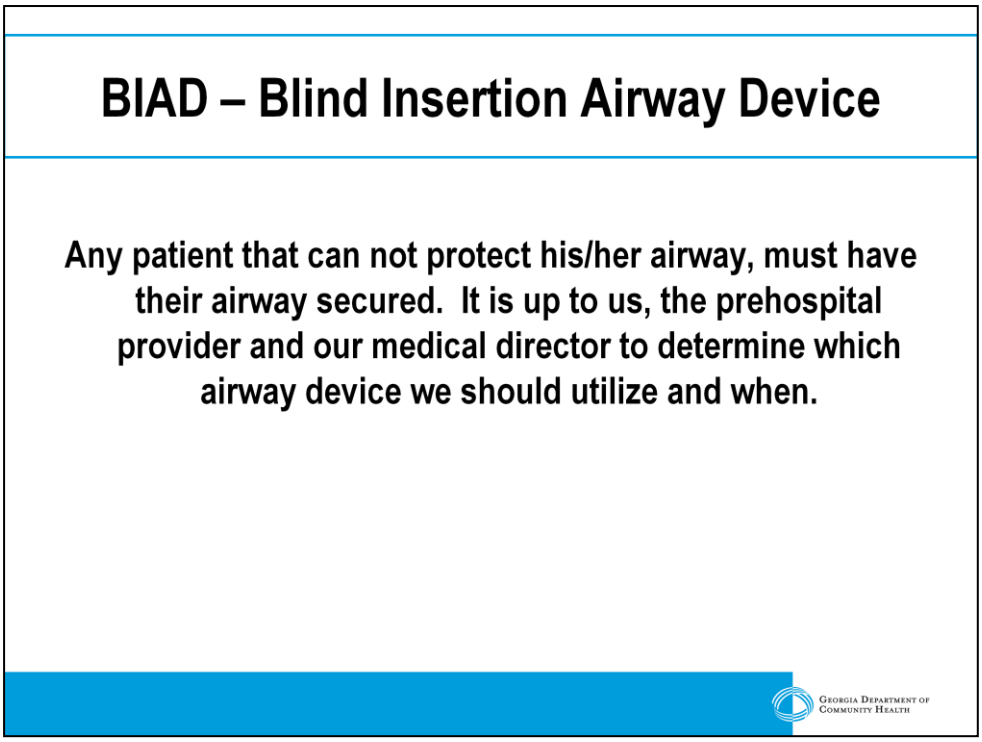
Your local medical director should establish protocols to help you determine when a BIAD should be inserted instead of using endotracheal intubation as your first line choice to secure your patients airway. Here are some generalized guidelines that may help you to determine if a BIAD should be attempted first over intubation.

First, ask yourself if the patient meets all the criteria for a BIAD. Do they meet the height and weight requirements for your device as an example.

Second, consider if there is a reason endotracheal intubation would be preferred over a BIAD. As examples, if your patient may require tracheal suctioning, or if there is a potential for laryngospasm, an endotracheal intubation may be preffered over a BIAD.



Additionally, providers should consider the patients anatomy to determine if this patient will probably be a difficult intubation. Consider this, if you are working a cardiac arrest on a patient who will definitely be a difficult intubation, is it better for your patient to pause chest compressions to perform this extended intubation, or better to just insert a BIAD without interruption of chest compressions? What about the trauma patient? Can I rule out cervical involvement, or would it be better to utilize a device that would not manipulate the spine as much? Regardless of which airway device you select, always ask yourself; is there a reason I selected this device over the others? Can I justify my reasoning?



Above all remember…Any patient that can not protect his/her airway, must have their airway secured. It is up to us, the prehospital provider and our medical director to determine which airway device we should utilize and when.

Generalized Insertion Principles

- Test the BIAD and ensure the cuffs inflate properly.
- Lubricant the device.
- Preoxygenate the patient.
- Using the tongue-jaw-lift, lift the tongue anteriorly to open the airway.
- Insert the airway device to the correct depth.
- Ventilate the patient and ausculate for epigastric sounds and bilateral lung sounds.
- Watch for adequate chest rise.
- Apply capnography and ventilate accordingly.
- Secure the device.

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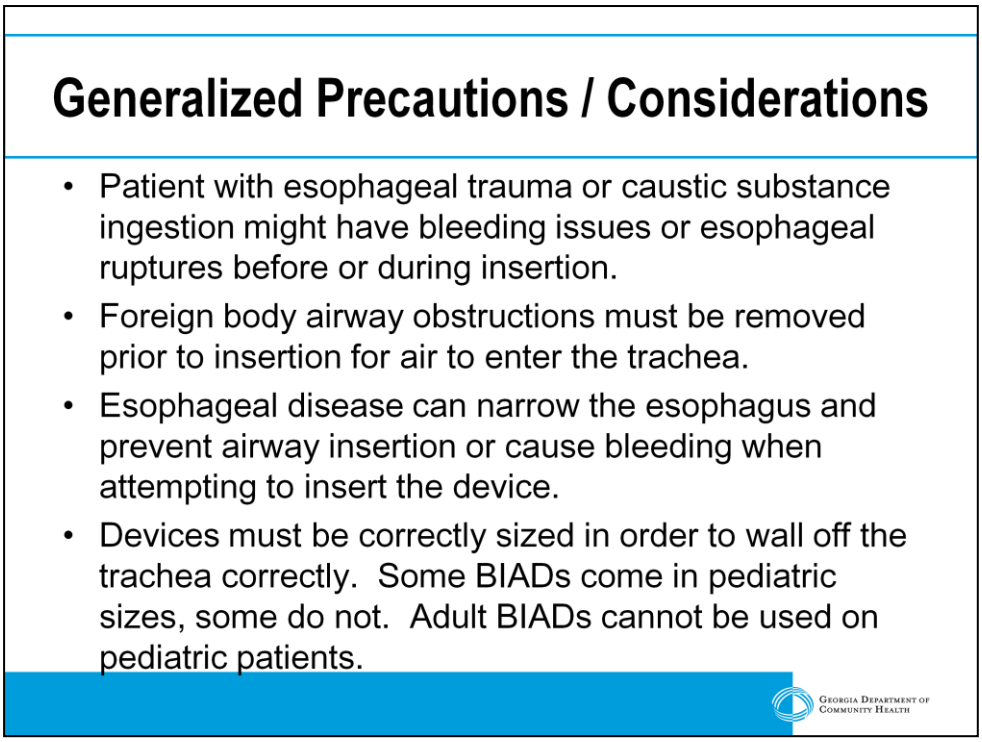
Take a few moments and review the generalized insertion principles for a BIAD. (PAUSE). As you can see, not much regarding insertion technique has changed other than adding capnography. Remember however, these are generalized insertion “principles” and you should become familiar with the particular BIAD carried by your service.



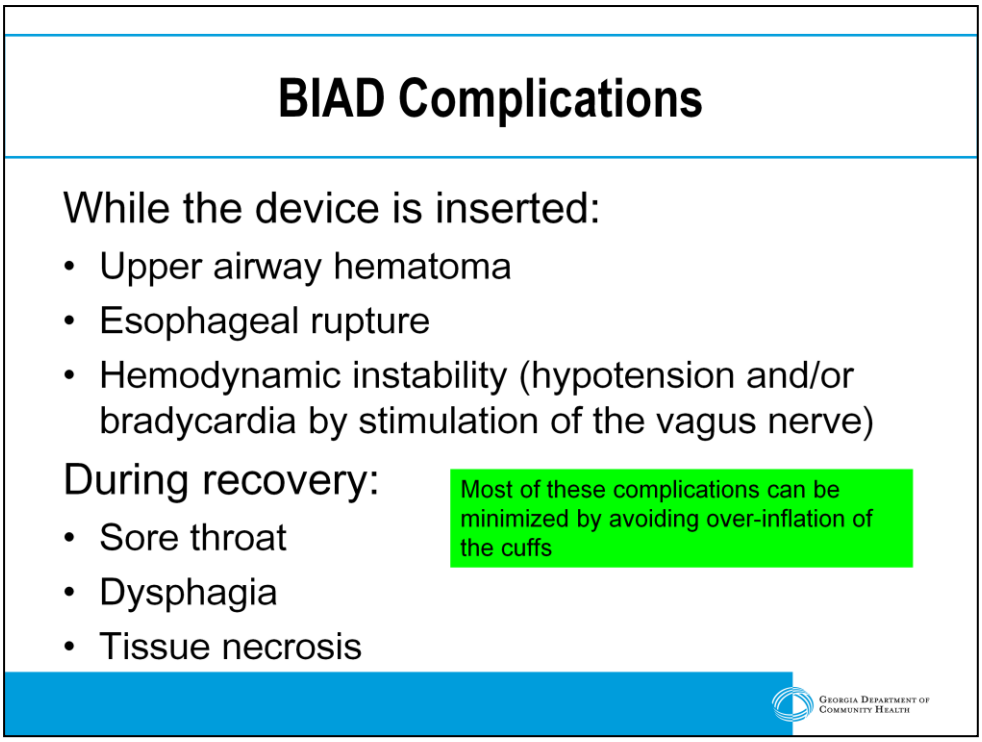
Here are some generalized precautions to consider regarding BIADs.

Patient with esophageal trauma or caustic substance ingestion might have bleeding issues or esophageal ruptures before or during insertion.

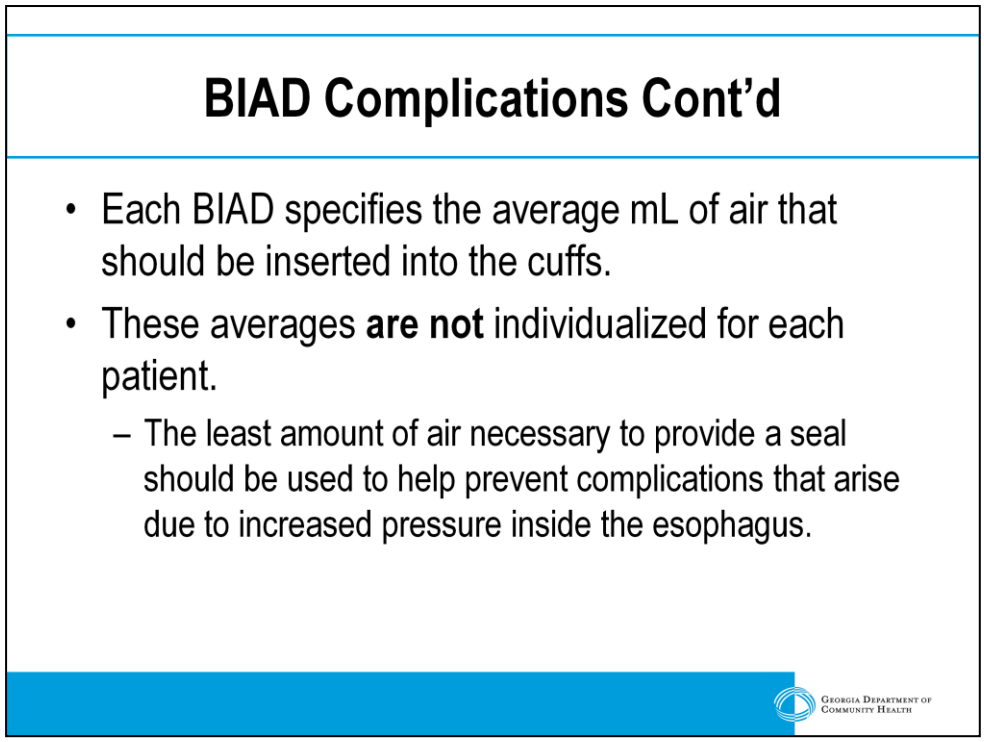
Foreign body airway obstructions must be removed prior to insertion for air to enter the trachea.

Esophageal disease can narrow the esophagus and prevent airway insertion or cause bleeding when attempting to insert the device.

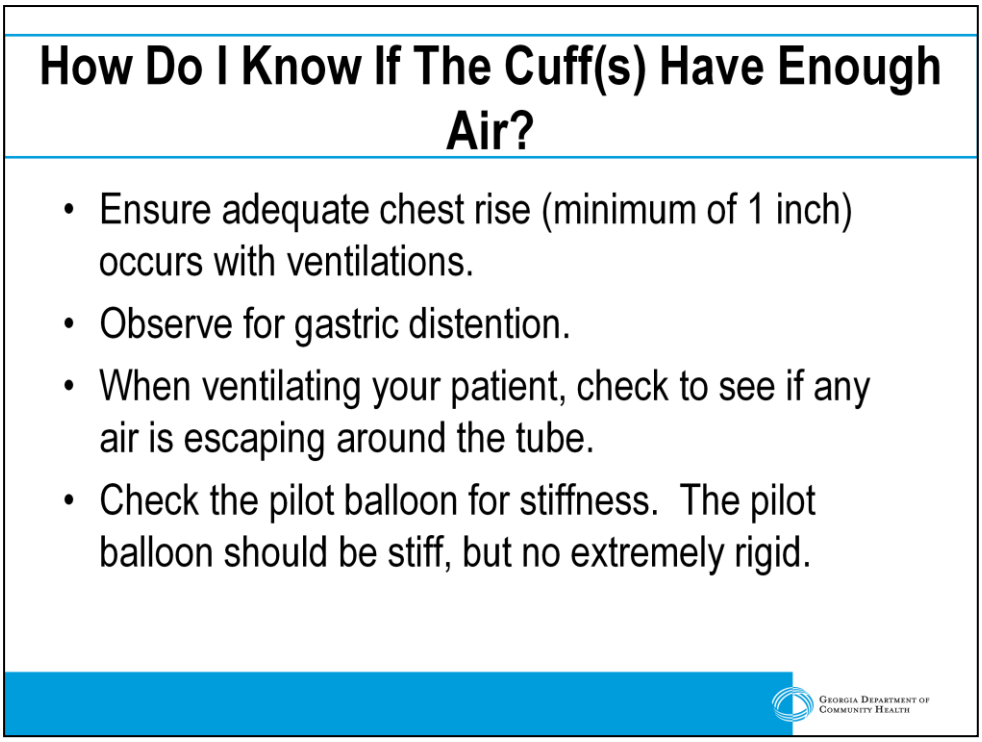
Devices must be correctly sized in order to wall off the trachea correctly. Some BIADs come in pediatric sizes, some do not. Adult BIADs cannot be used on pediatric patients.



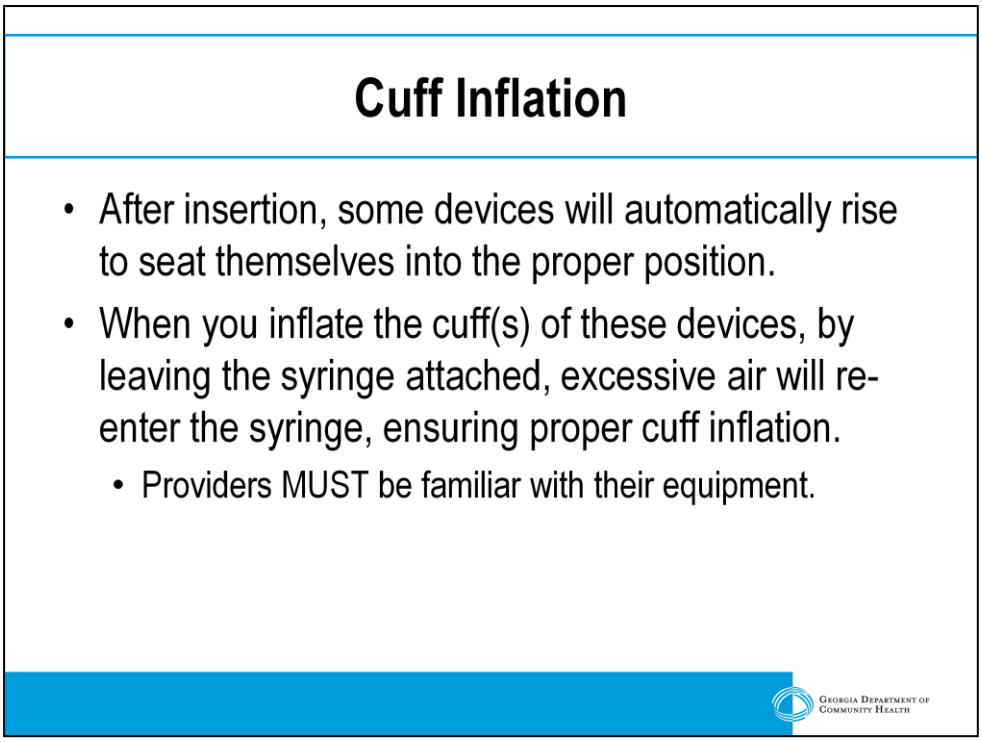
Here are a few complications that can occur from BIAD insertion. Most of these complications occur from the cuff(s) being over inflated, or the BIAD being inserted with too much force. To avoid these complications, cuff inflation should be the least amount possible to provide an airway seal and BIAD placement should be gentle. If the tube won't go, forcing it will only lead to additional complications.



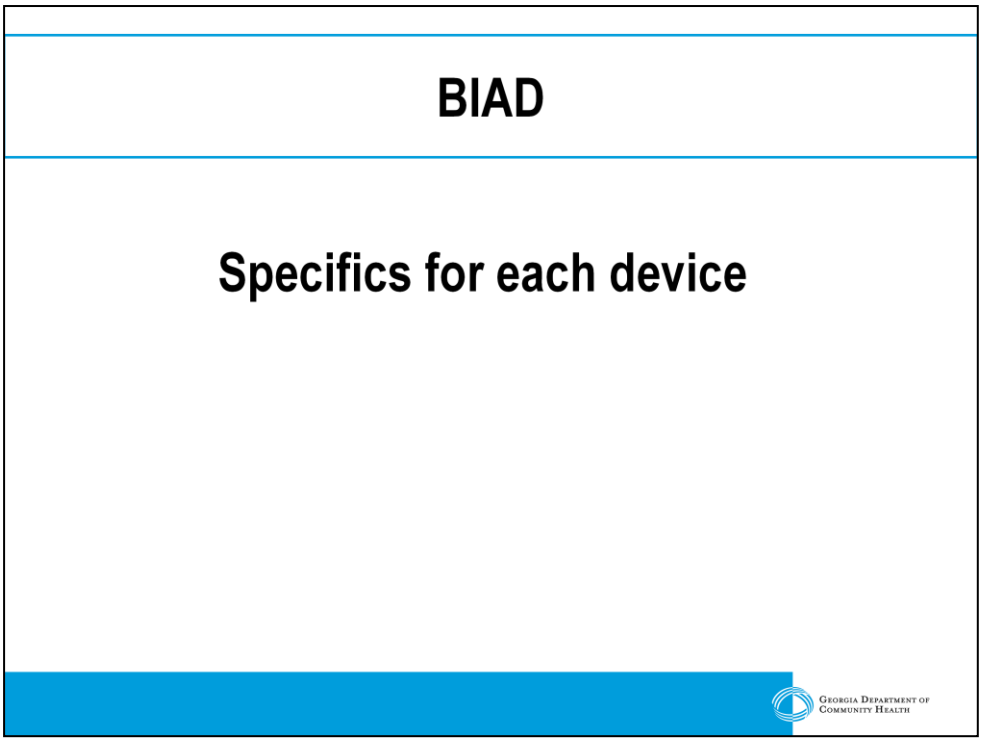
Regardless of which BIAD you use, you will find an indication of how many mL of air should be put into the cuff(s). As you are aware, individual anatomy can be different and thus the necessary mL may vary as well. A good standard to follow to ensure a good seal, yet prevent the complications we just discussed is to insert the least amount of air necessary to provide a seal and avoid overinflation.



Since most of our complications arise from over inflation of the cuffs, we need to be able to determine if we have enough air to properly ventilate our patient. Look for adequate chest rise during ventilations and observe for gastric distention. Check to make sure no air is leaking around the tube and feel the pilot balloon for stiffness. All of these are good measurements to making sure your cuff inflation is accurate. Above all, look towards the patients chest rise if there is any doubt regarding cuff inflation.

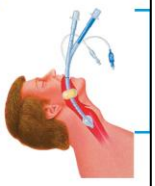


After the BIAD is inserted, some devices will automatically rise to seat themselves with ventilations. Follow the manufacturer recommendations for each device. For some devices you will leave the syringe attached and excessive air will re-enter the syringe. Providers must know their equipment.



For the next several minutes we will briefly discuss the three most common BIADs.

Combitube



- Dual (two) lumen device
  - Comes in small and large size.
  - Has two separate lumens.
  - Has two inflatable cuffs that are inflated separately.
    - Proximal cuff inflated first (big cuff)
    - Distal cuff inflated last (smaller cuff)
  - Usually rests in the esophagus, but can inadvertently enter the trachea.
  - No pediatric size is available
  - Allows for gastric decompression

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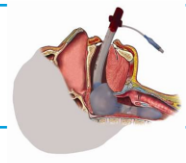
(While showing a demonstration of insertion, read the slide above)

King



- Newer device.
- Dual (two) lumen device with only one lumen exposed for ventilation.
- Have two cuffs that inflate simultaneously.
- Allows for gastric decompression.
- Pediatric sizes are available.

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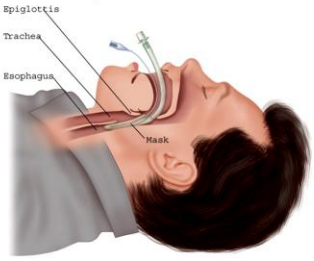
(While showing a demonstration of the King airway… explain the King is a newer device similar to the combitube. Demonstrate how both cuffs are inflated at the same time and the location of the suction port. Unlike the Combitube, the King comes in pediatric sized)

LMA Supreme

- The LMA Supreme is a newer device than the original LMA and is utilized by some prehospital services.
- Single lumen device that seats over the glottic opening.
- Single cuff.
- Allows for gastric decompression.
- Pediatric sizes are available.



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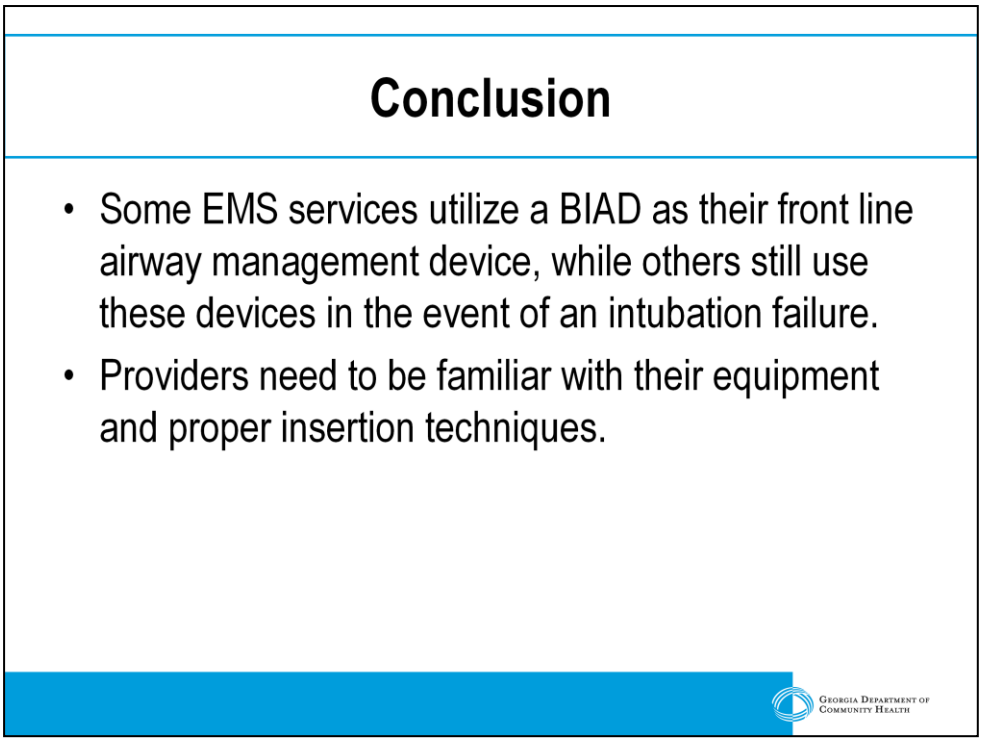
(While showing a demonstration of insertion… explain the LMA Supreme is a newer, more prehospital friendly version of the old LMA. The LMA is different from the Combitube and King airways in that it is a single lumen device that seats directly over the glottic opening. Pediatric sizes are available.)



In conclusion, BIADs have changed over the years, but the general principles and guidelines for insertion remain relatively the same. The biggest change regarding these devices is the concept of utilizing these devices instead of immediately going to an endotracheal tube to secure an airway. Local medical direction should guide providers in selecting the best method for providing advanced airway management.

Additional Information

http://vam.anest.ufl.edu/airwaydevice/combitube/index.html

http://www.kingsystems.com/medical-devices-supplies-products/airway-management/supraglottic-airways/disposable-supraglottic-gastric-access

http://www.ncbi.nlm.gov/pubmed/18644845